

Southwest Fisheries Science Center
P.O. Box 271
La Jolla, CA 92038-0271

June 4, 1993

F/SWC1:SMM

CRUISE REPORT

VESSEL: NOAA Vessel *David Starr Jordan*, 9304-JD, DS-93-05, (253).

CRUISE DATES: March 30 - April 19, 1993.

PROJECT: Coastal Fisheries Resources Division, CalCOFI Survey.

ITINERARY: Leg I. Departed Nimitz Marine Facility (MARFAC) at 0800 on March 30, 1993. Proceeded to CalCOFI station 93.26.7 (32° 57.40'N; 117° 18.30'W) and began standard CalCOFI operations (see attached cruise track). Completed the full pattern on April 14th and returned to MARFAC on the 15th of April, 1993. SIO vans were off loaded and SIO scientists disembarked.

Leg II. Embarked additional NOAA and CDFG scientists and moved to a site offshore of San Diego to perform preliminary tests to the high-speed midwater trawl. Continued moving north to work in conjunction with a spotter plane in an area off of Newport Beach. Completed trawling operations and returned to MARFAC on April 19, 1993.

OBJECTIVES:

1. To continue an ongoing assessment of pelagic fish stocks between Morro Bay and La Jolla, California.
2. To monitor environmental conditions within the CalCOFI survey area.
3. To conduct a continuous underway sampling of surface waters (CUDLS - CalCOFI Underway Data Logging System). Temperature, salinity and chlorophyll were automatically logged by computer with the output from the GPS navigational unit.
4. To record current profiles throughout the duration of the cruise with the Acoustic Doppler Current Profiler (ADCP).
5. To collect sardine and anchovy larvae for DNA

studies.

6. To collect live copepods for ongoing egg production studies.
7. To conduct chlorophyll irradiance levels at various depths using the MER optical package.
8. To conduct trawling operations using the high-speed midwater trawl. The objective was to maximize the efficiency of the net using various rigging configurations. In addition, the feasibility of using a spotter plane to locate, identify and set on schools of sardines was determined.

PROCEDURES:

1. Each standard CalCOFI station included the following:
 - a. A hydrocast of 20 Bryan bottles to 500 meters, depth permitting. Sea water from the hydrocast was analyzed for chlorophyll from 200 meters and above, oxygen, salinity, and temperatures from all depths.
 - b. A CalBOBL (CalCOFI Bongo) standard oblique plankton tow with 300 meters of wire out, depth permitting, used paired 500 μ m mesh nets with 71 cm diameter openings. The technical requirements for this tow were: Descent rate of 50 meters per minute, ascent rate of 20 meters per minute. All tows with ascending wire angles lower than 38° or higher than 51° in the final 100 meters of wire were repeated. Additionally, a 45° wire angle was closely maintained during the ascent and descent of the net frame.
 - c. A Manta net (surface) tow, using a 505 μ m mesh net on a frame with a mouth area of 0.1333 m².
 - d. On each line out to and including station 70.0, a vertical Pairovet net tow was conducted. The net was deployed at a descent rate of 70 meters/min. down to 70 meters of depth (depth permitting). The net was held for 10 seconds at depth and retrieved at an ascent rate of 70 meters/min.
 - e. Weather observations.
 - f. At about 1100 hours on each day of the cruise

a primary productivity cast consisting of six 5-liter Niskin bottles was carried out. The cast arrangement was determined by a Secchi disc observation. The purpose of the cast was to collect water from 6 discrete depths for daily *in situ* productivity experiments. Measurements of extracted chlorophyll and phaeophytin were obtained with a fluorometer. Primary production was measured as C^{14} uptake in a 6 hour *in situ* incubation. Nutrients were measured with an auto-analyzer. All radioisotope work areas were given a wipe test before the departure of the SIO technical staff.

g. At specified stations, the MER optical package was deployed down to 200 meters depth (depth permitting) to measure irradiance levels at specific depths.

h. At specified stations, a 3 bottle cast consisting of 5-liter Niskin bottles was deployed in addition to the standard hydrocast. The bottles were arranged at approximately 0, 50 and 100 meters depth.

2. Tows to collect larvae and zooplankton used the same procedures as in 1b above.
3. The high-speed midwater trawl was towed using a variety of rigging setups. Adjustments were made to the trawl doors, bridles, set-back, tom weights, trawl warps and ship speed. For each tow the net configuration was measured using a Furuno netsonde, Scanmar spread sensors and time/depth recorders (TDRs) in various positions on the trawl.

RESULTS:

<u>Activity</u>	<u>Requested</u>	<u>Completed</u>	<u>Aborted</u>
CalBOBL	66	66	0
Manta	66	66	0
Pairovet	42	41	1
Weather	66	66	0
Surface Temp.	66	66	0
Hydrocast	66	66	0
Salinity	66	66	0
Oxygen	66	66	0
Nutrient	66	66	0
Chlorophyll	66	66	0
Phytoplankton	66	66	0
Keeling (CO ₂)	3	3	0

Primary Prod.	13	13	0
Underway samples	66	66	0
ADCP (NM)	1975	1975	0
CUDLS (NM)	1975	1975	0
Midwater Trawls	19	19	0

DISPOSITION OF DATA:

CalBOBL, Manta tow data sheets and preserved samples - Richard Charter, SWFSC (NMFS).

Station activity logs, weather data, surface temperature data and high-speed midwater trawl data - Richard Charter, SWFSC (NMFS).

ADCP data - Paul Smith, SWFSC (NMFS).

Hydrocast data (temperatures, salinities, oxygens, nutrients and chlorophylls) - Arnold Mantyla, MLRG (SIO).

Phytoplankton samples - Elizabeth Venrick, MLRG (SIO).

Water samples for CO₂ analysis - Charles Keeling, (SIO).

Live zooplankton data - Michael Mullin, MLRG (SIO).

Larvae for DNA studies - Russell Vetter, SWFSC (NMFS); John Hakanson (SIO).

Optical profile data - Gregg Mitchell, MLRG (SIO).

INCIDENTS & MALFUNCTIONS:

The port winch brake/clutch assembly was unable to handle the weight of the new CTD/rosette package. All primary productivity work was done on the starboard wire using 5-liter Niskin bottles.

U.S. Naval operations near station 86.7 55.0 caused a two hour delay.

On leg II the high speed mid-water trawl was successfully deployed and retrieved 19 times. While the Furuno netsonde system performed satisfactorily, the Scanmar spread sensor signals were received sporadically or not at all. A spotter pilot worked with the ship during the final net trawls. The operation went smoothly.

COMMENDATIONS: The personnel of the *David Starr Jordan* should be recognized and commended for their dedication and professional manner, insuring the completion of the cruise:

The deck department for their ability to meet the needs of all types of gear with speed and expertise.

The bridge officers for their assistance with all sampling operations as well as assuring the safety and well-being of all personnel aboard.

The engineering department for their performance and ability correcting major and minor malfunctions to allow the completion of the cruise with little or no loss of time.

The electronics specialist for his dedication in locating and correcting all malfunctions in a timely and efficient manner.

The stewards department for providing wonderful meals in all weather conditions.

In addition, the scientific staff personnel of SWFSC, MLRG and PRBO should be commended on their ability to continuously collect high quality data throughout the duration of the cruise.

PERSONNEL:	Sue Manion, Cruise Leader	SWFSC
	David Griffith	SWFSC
	Ron Dotson	SWFSC
	Dimitry Abramenkoff	SWFSC
	Ed Renger, Technical Coordinator	MLRG
	Sherry Gripp	MLRG
	Dennis Gruber	MLRG
	Jim Wilkinson	MLRG
	David Bos, Auto Analyzer Operator	ODF
	Michael Mullin	MLRG
	Gregg Mitchell	MLRG
	Eric Brody	MLRG
	Richard Veit, Bird Observer	PRBO

NMFS personnel authorized per diem at the rate of \$2.00 per day to be paid via the Imprest Fund on a Travel Roll Voucher at the termination of the cruise.

Charge to account #8L1A6AHO

WATCH HOURS: 0000 - 1159

1200 - 2359

Date: _____

Prepared by: _____
Susan Manion,
Cruise Leader

Approved by: _____
Richard Neal, Acting
Science & Research Director,
SWR